

123

II

Total No. of Questions – 21

Regd.

Total No. of Printed Pages – 2

No.

**Part - III**  
**CHEMISTRY, Paper-I**  
**(English Version)**

Time : 3 Hours]

[Max. Marks : 60

Note : Read the following instructions carefully :

- (1) Answer **all** the questions of Section – ‘A’. Answer any **six** questions in Section – ‘B’ and any **two** questions in Section – ‘C’.
- (2) In Section – ‘A’, questions from Sr. Nos. **1** to **10** are of “Very short answer type”. Each question carries **two** marks. Every answer may be limited to **two** or **three** sentences. Answer all these questions at one place in the same order.
- (3) In Section – ‘B’, questions from Sr. Nos. **11** to **18** are of “Short answer type”. Each question carries **four** marks. Every answer may be limited to **75** words.
- (4) In Section – ‘C’, questions from Sr. Nos. **19** to **21** are of “Long answer type”. Each question carries **eight** marks. Every answer may be limited to **300** words.
- (5) Draw labelled diagrams, wherever necessary for questions in Section – ‘B’ and Section – ‘C’.

## SECTION – A

10 × 2 = 20

Note : Answer **all** questions.

1. What is greenhouse effect ?
2. Why gypsum is added to the cement ?
3. What is PAN ? What effect is caused by it ?
4. Define Le Chatelier’s principle.
5. Which of the two cations  $\text{Ca}^{2+}$  or  $\text{Zn}^{2+}$  is more stable and why ?
6. What is Boltzman’s constant ? Give its value.
7. What is meant by bond order ? What is the bond order of  $\text{N}_2$  molecule ?
8. What is the oxidation number of “S” in the following compounds :
  - (a)  $\text{H}_2\text{SO}_4$
  - (b)  $\text{H}_2\text{S}_4\text{O}_6$
9. Lithium salts are mostly hydrated. Why ?
10. Give the structural formulae of
  - (a) 2, 3-dimethyl butane
  - (b) 5-ethyl, 3-methyl heptane



**SECTION – B****6 × 4 = 24****Note :** Answer any **six** questions.

11. Explain the structure of  $\text{SF}_6$  with hybridisation.
12. Deduce (a) Boyle's law and (b) Charles law from kinetic gas equation.
13. What is conjugate acid-base pair ? Write the conjugate acid and conjugate base of each of the following :
  - (a)  $\text{OH}^-$
  - (b)  $\text{HCO}_3^-$
14. Define heat capacity. Derive  $C_p - C_v = R$ .
15. Explain with suitable example the following :
  - (a) Electron deficient hydrides
  - (b) Electron precise hydrides
16. Explain the structure of diborane.
17. Explain the difference in properties of diamond and graphite on the basis of their structure.
18. A compound contains 4.07% Hydrogen, 24.27% Carbon and 71.65% Chlorine. Its molar mass is 98.96 grams. What are its empirical and molecular formulas ?  
( $H = 1.008, C = 12.01, Cl = 35.453$ )

**SECTION – C****2 × 8 = 16****Note :** Answer any **two** questions :

19. Explain four Quantum numbers with their significances.
20. What is periodic property ? How the following properties vary in a group and in a period ? Explain.
  - (a) Atomic radius
  - (b) Electronegativity
  - (c) Ionisation enthalpy
21. (a) Explain :
  - (i) Wurtz reaction
  - (ii) Friedel-Crafts alkylationreaction with one example for each one of them.
- (b) Name the products A, B and C formed in the following reaction. Give the equations for the reaction.

